

Thaxter (R.)

THAXTER. — LABOULBENIACEÆ.

467

al

XX.

CONTRIBUTIONS FROM THE CRYPTOGAMIC LABORATORY OF HARVARD UNIVERSITY.

XXVI.—NOTES ON LABOULBENIACEÆ, WITH DESCRIPTIONS OF NEW SPECIES.

By ROLAND THAXTER.

Presented November 23, 1894.

LABOULBENIA PILOSELLA Robin.

(*Traité du Microscope*, p. 912, Fig. 285.)

Through the kindness of Professor Giard the existence of a species bearing this name has been brought to the writer's attention, and an examination of the figure which accompanies its description leaves little doubt of its identity with the form described by the writer on European specimens of the genus *Lathrobium* under the name *Acanthomyces brevipes*. The plant figured by Robin is said by him to occur on a member of the same genus, and his drawing, though coarse, corresponds so closely in essentials that the two may be considered synonymous. In selecting the name *Acanthomyces*, however, the writer was not aware of its previous use by Lebert in a zoölogical publication, the *Acanthomyces aculeata** of this writer having escaped the notice of compilers in recent years. In view of this fact a new designation for the genus of Laboulbeniaceæ becomes necessary, and the writer would suggest for this purpose the name *Rhachomyces*, from the resemblance which the main axis of these plants bears to a vertebral column. The new name will therefore include the six described species, *Rhachomyces longissimus*, *R. lasiophorus*, *R. hypogaeus*, *R. Lathrobii*, *R. furcatus*, and *R. pilosellus* (Robin), to which may be added a seventh form, parasitic, like *R. hypogaeus*, on a blind cave beetle.

* *Zeitschr. f. wissenschaft. Zoologie*, 1858, Vol. IX. p. 447.



RHACHOMYCES nov. nom. = ACANTHOMYCES THAXTER.

RHACHOMYCES SPELUNCALIS, nov. sp.

Perithecium more or less deeply suffused with brown; short and stout, with a broad bluntly rounded apex. Receptacle slender, the main axis constricted strongly at the septa, its cells rather small, the basal slender and cylindrical; the remainder, about nine in number, all evenly and rather deeply suffused with brown, and more or less uniform in size. Appendages mostly opaque, more or less rigid, hyaline-tipped, those surrounding the base of the perithecium hardly equalling it in length, a few lower on the receptacle exceeding its apex by the whole length of the plant: of the shorter median appendages some are terminated by a peculiarly modified partly hyaline (antheridial?) cell, the neck-like tip of which curves strongly outwards, terminating bluntly. Perithecia $90 \times 37 \mu$. Receptacle about 110μ (when not proliferous). Longest appendages 300μ . Total length to tip of perithecium 185μ to 260μ (in proliferous forms).

On *Anophthalmus pusio* Horn. West Virginia.

The smallest species of the genus, more nearly allied to *R. lasiophorus* in the form of its perithecium and the disposition of its appendages around the base of the latter. It is quite distinct, however, from any of the described species.

DIPLOMYCES, nov. gen.

Flattened antero-posteriorly, sub-triangular, bilaterally symmetrical, furcate through the presence of a pair of prominent posterior projections. The receptacle consisting of two superposed cells, followed by four cells placed antero-posteriorly in pairs, of which the posterior produce the characteristic prominences; the anterior a pair of short stalked perithecia, near the base of which, within and above, arise two or more pairs of appendages, and eventually a second pair of perithecia. Appendages copiously branched, many of the branchlets terminated by beak-like cells. Spores once-septate.

A singular genus, recalling Teratomyces, to which it seems most nearly allied through the presence of the characteristic terminal beak-like cells of its appendages. The branching of the latter is not, however, sympodial in a single plane, as is the case in Teratomyces, and the general structure of the receptacle is difficult to homologize with that of any other genus. The second pair of perithecia arise in all probability from secondary divisions of the pair of perithecia-bearing

cells above described; but the exact structure in this region, behind the stalk cells of the perithecia, has not been made out satisfactorily. An obliquity in the septum which separates the basal and sub-basal cells sometimes results in the apparent absence of any sub-basal cell.

DIPLOMYCES ACTOBIANUS, nov. sp.

More or less faintly tinged with brownish. Basal cell of receptacle triangular, sub-basal cell flattened or wedge-shaped; the posterior prominences peculiar to the genus nearly as long as the receptacle itself, slightly divergent, two-celled, the terminal cell twice as long as the basal, tapering slightly towards its rounded extremity. On the anterior side the two peritheciogenous cells bear the first pair of perithecia on short stalk-cells bent abruptly upwards, divergent, and succeeded by three small cells forming the base of the perithecium. The perithecia rather slender, curved towards the receptacle so that their tips project beyond it, divergent, rather long and slender, tapering slightly, the apex blunt with ill defined lips, the base of the old trichogyne persisting conspicuously below the pore. Appendages branching, arranged in pairs symmetrically like the perithecia; a smaller one arising just behind the stalk cell of the perithecium, a much larger one above this followed by a few smaller ones less definitely arranged in the region whence a second pair of perithecia may arise. All the appendages more or less copiously branched, the branchlets terminating in many cases by the slender, curved and sharply pointed cells characteristic of *Teratomycetes*. Spores $32 \times 2 \mu$. Perithecia, including stalks, about $75 \times 12 \mu$. Receptacle to tips of prominences 75μ . Total length to tip of perithecia 110μ . Greatest width 37μ .

On *Actobius nanus* Horn. Massachusetts.

This species occurs rather rarely on the abdomen of a large brown variety of *Actobius nanus*, but not as far as has been observed on the normal form. A second form, perhaps distinct from the present, was found on the abdomen of a small *Philonthus*, and is distinguished by the presence of slender thread-like branches from the larger appendages. Sufficient material of this form was not, however, obtained, and it may prove to be nothing more than a variety of the one above described.

SPHALEROMYCES OCCIDENTALIS, nov. sp.

More or less evenly tinged with brownish. Perithecium large, sub-fusiform, with faintly defined ridges at the divisions between the wall

cells, the apex made externally oblique through the outgrowth of one of the lip cells which forms a pointed projection beyond the pore; the stalk cell wholly free, tapering to a narrow base, and about as long as the receptacle proper. Receptacle small, pointed below, its sub-basal cell united throughout its length to the basal cell of the appendage, its basal and sub-basal cells separated by a horizontal septum. The appendage straight, rigid, tapering, composed of a series of usually four superposed cells separated by oblique partitions, and bearing short branches with flask-shaped antheridia from their upper inner angles. Perithecia $200 \times 45 \mu$. Length to tip of perithecia 350μ . Length to tip of appendage 200μ . Length of receptacle 55μ .

On *Pinophilus densus* Lec. Utah.

The occurrence of a second well marked species, abundantly distinct from the type, serves to settle any doubts which may have existed concerning the validity of this genus. The present form was found on the abdomen of its host, and is readily distinguished from *S. Laethobii* by the peculiarly modified tip of its perithecium, as well as by other important differences.

LABOULBENIA HAGENI, nov. sp.

More or less deeply tinged with brown. Perithecium slightly inflated, tapering to the blunt outwardly oblique apex, which is blackened below the hyaline lips. Appendages arising from an outer and an inner basal cell, the outer of which is followed by a squarish cell of about the same size, from the end of which project four rather short, rigid, slightly divergent hyaline branches, which taper to blunt tips, and, as a rule, hardly exceed the tip of the perithecium: the inner basal cell gives rise to two squarish cells, one on either side, each of which bears usually a pair of branches similar to those just described. Receptacle short and stout, normal in form, the lower portion of the basal cell hyaline. Perithecia $55 \times 18 \mu$. Appendages (longest) 65μ . Total length to tip of perithecium 100μ .

On *Termes belllicosus* var. *Mozambique* Hagen. Africa.

The occurrence of a most typical and decidedly insignificant looking species of this genus on a larva of the worker of a species of white ant is certainly quite unexpected in view of the wide difference which exists between this Neuropterous host and the usual insects infested by the genus. But for the four stiff branches arising from the sub-basal cell of the outer appendage, and suggesting the roots of a molar tooth, it would be difficult to specify its distinguishing characters. The species is dedicated to the memory of the late Professor Hagen,

by whom it was observed many years since on the same specimen examined by the writer, collected by Dr. Peters in Africa, from all parts of which sufficiently abundant material was obtained.

LABOULBENIA KUNKELII (GIARD).

Thaxteria Kunkelii GIARD, Comptes Rendus Hebdomadaires des Séances de la Société de Biologie, Sér. IX., Vol. IV. p. 156.

Through the kindness of Professor Giard, the writer has had an opportunity of examining specimens of this remarkable species, which is by far the largest member of the family, measuring between three and four millimeters from its base to the tip of the perithecium. It occurs with the succeeding species on the elytra and thorax of *Mormolyce phyllodes* Hagenb., a carabid beetle, native in the East Indies. The writer is unable to agree with Professor Giard in believing that this form, however singular, should be separated generically from Laboulbenia, to which it seems to correspond in every essential detail. The type of cell arrangement, so characteristic in Laboulbenia, is followed without deviation; while the appendages also originate in a manner much more typical than is found in very many species of this genus. The elongation of the basal wall cells of the peritheciun to form a stalk-like base finds also an exact parallel in species like *L. Galeritæ*, *L. longicollis*, *L. melanotheca*, and other forms, the generic reference of which is not to be disputed.

LABOULBENIA PALMELLA, nov. sp.

Perithecium nearly straight, almost opaque, sometimes slightly inflated, its tip nearly symmetrical, truncate, its inner walls often having a corrugated appearance, the four lower wall cells elongated and contracted to form a short stalk below and about one third as long as the ascigerous portion. Appendages arising from two small basal cells: *an outer* which gives rise to a series of two or three opaque branches placed antero-posteriorly, the inner of which alone reaches any considerable size, branching sympodially in an antero-posterior plane, the main axis opaque, successively inflated below the branchlets which are usually about ten in number, opaque with hyaline tips: *an inner* which gives rise to a single branch on either side consisting of a subcylindrical basal cell, black below, nearly hyaline above and followed by a series of sympodial branchlets like those of the outer appendage. Receptacle short, tapering rapidly to the base, wholly black and opaque with the exception of the whole or a portion of its basal

cell which may be hyaline and is abruptly bent above the very large hoof-like haustorium or blackened point of attachment. Spores $150 \times 12 \mu$. Perithecium $580 \times 75-100 \mu$, its neck $75-150 \times 35-65 \mu$. Receptacle $300-400 \mu$, its greatest width $75-100 \mu$. Appendages (longest) 500μ , the branchlets about $225-250 \times 7-8 \mu$. Total length to tip of perithecium, 1-1.1 mm.

On *Mormolyce phyllodes* Hagenb. Perak, Molucca, Java.

The writer is indebted to Professor Riley for abundant material of this species found by Mr. Schwarz on a specimen of *Mormolyce* in the National Museum labelled "Java," as well as to Mr. Beutenmueller who has kindly sent material derived from a specimen in the Central Park Museum labelled Molucca. Professor Giard has also most generously allowed him to examine the original specimen of *Mormolyce* from Perak on which the types of *L. Kunkelii* were associated with the present species. The two species are very closely allied, and were found intermingled towards the base of the elytra, although the smaller was much more abundant on the flattened margins where it presents the appearance under a hand lens of a grove of little palm-trees. The absence of any transitional forms between the two species seems to render it unlikely that they should prove merely varieties of a single form, while the much smaller size of *L. palmella*, its wholly opaque and short receptacle, straight short-necked perithecium, large hoof-like base, together with the absence of furcation in the main axis of the two lateral branches of its inner appendage, afford constant and sufficient specific differences. The antheridia appear to be represented by flask-shaped bodies borne on short hyaline branches near the tips of the branchlets of the inner appendages. The trichogynes are well developed and more or less copiously branched.

LABOULBENIA MELANOTHECA, nov. sp.

Tinged with pale reddish brown, except the nearly black perithecium. Perithecium long, straight, symmetrical, subcylindrical or but slightly inflated, narrowed abruptly to the symmetrical apex, its basal wall cells elongated to form a neck-like stalk about one fourth as long as its main body, projecting from the receptacle at an angle to its long axis towards and beyond the appendages. Appendages as in *L. mexicana*, hardly exceeding the perithecium in length, consisting of two basal cells; the outer producing an outer and an inner branch either simple or once branched; the inner producing single branches on either side. Receptacle elongate expanding very gradually from the base, distally abruptly rounded and contracted below the insertion cell

on one side and the neck-like base of the perithecium on the other. Spores $95 \times 5.5 \mu$. Perithecium $220-245 \times 60-65 \mu$, its neck-like base about $75 \times 30 \mu$. Receptacle about $515 \times 100 \mu$. Total length to tip of perithecium $800-835 \mu$.

On *Galerita mexicana* Chaud. Nicaragua.

This species has been previously referred to by the writer as a possible hybrid between *L. mexicana* and *L. Galeritæ*. It seems on more careful comparison, however, to be abundantly distinct from either. The neck-like base of the perithecium appears to be formed from the elongated basal wall cells of the perithecium which lie wholly below the ascogenic cells. The eight types were found on the elytra of their host in company with *L. mexicana*.

LABOULBENIA DECIPiens, nov. sp.

Perithecium nearly opaque, not punctate, large, slightly and evenly inflated, tapering rather abruptly to the nearly symmetrical apex; the basal wall cells forming a short stout clearly defined neck; the septa separating the upper wall-cells deeper blackish and spirally twisted. Appendages arising as in *L. Galeritæ* from a conical cellular base consisting of one outer and two inner rows of superposed cells, each of which bears a single simple straight septate branch, its lower segments slightly inflated, hardly exceeding the tip of the perithecium. Antheridia blackish, with a very long curved neck, borne singly or two together from the sub-basal cell of the inner series of superposed cells. Receptacle as in *L. Galeritæ* except that cell (3) extends upwards nearly to the black insertion cell of the appendages, cells (4) and (5) being wholly included by it. Color sub-hyaline with brownish suffusions especially in the region of cells (4) and (5). Perithecium $175-278 \times 55 \mu$ (smallest $130 \times 37 \mu$), its stalk-like base $40-55 \times 30 \mu$. Receptacle (larger) $300 \times 75 \mu$.

On *Galerita aequinoctialis*. Guatemala.

This species is remarkable for its close resemblance to *L. Galeritæ*. It is at once distinguished by the position of cell (3), and by the peculiar twist of its perithecial wall cells which are not punctate as in the latter species.

LABOULBENIA ASPIDOGLOSSÆ, nov. sp.

Perithecium black, almost opaque, rather narrow, the inner margin curved abruptly outwards to the rather large apex, its lips very oblique outwards. Appendages arising from two basal cells which

are nearly equal in size: the outer inflated and separated from the cell above it by a blackened septum, this sub-basal cell roundish, inflated, about as large as the basal cell and giving rise to two branches, an outer and an inner; the outer separated from it by a blackened septum and consisting of a basal cell with three terminal branchlets the inner of which is deeply and broadly blackened at its base, while the other two are wholly hyaline and fertile: the inner branch from the sub-basal cell has no blackened basal septum and produces several short branchlets bearing numerous antheridia. The inner appendage, like the outer, consists of a roundish or squarish basal cell separated from a sub-basal cell by a blackened septum; the sub-basal cell producing a tuft of short branches bearing at their tips two to four antheridia or becoming more elongate and sterile. Receptacle normal, the two basal cells rather slender, elongate, colorless; the distal cells suffused with blackish brown. Perithecia $110-120 \times 40 \mu$. Appendages (longest) 240μ . Total length to tip of perithecium 333μ , greatest width 63μ .

On *Aspidoglossa subangulata* Chaud. Kansas (M. A. Barber).

A species clearly marked by the peculiarities of its appendages, which, unlike almost all other species of the genus, are fertile without regard to their external or internal origin.

LABOULBENIA MACROTHECA, nov. sp.

Amber-yellow. Perithecium large, evenly inflated, the curvature from base to apex nearly symmetrical on either side, the apex rather large, outwardly oblique, with a blackish basal shade; the remainder of the perithecium translucent, amber-colored, the walls thick, the spore mass large. Appendages flexuous, thick, pale amber-colored or tinged with purplish, arising from two cells, the inner small and roundish, the outer much larger, two or three times as long, usually bearing a single cell with two terminal more commonly simple branches; the inner producing two branches each several times branched: the outer appendages especially more or less constricted at the septa. Receptacle small, usually short and slender, the basal cell long, narrowed towards its base, the sub-basal cell short, the remaining cells relatively small. Perithecium $130-150 \times 45-55 \mu$. Spores $60 \times 5.5 \mu$. Appendages (longer) 185μ . Receptacle $150-165 \times 35-40 \mu$. Total length to tip of perithecium 240μ (longest 270μ), greatest width $55-60 \mu$.

On *Anisodactylus Baltimorensis* Say. Maine. On *Anisodactylus* sp.? Bathurst, N. B. (H. M. Richards).

This species occurs not rarely on the anterior legs of its host, less frequently on the borders of the elytra. It may be distinguished by its pale amber color, large evenly inflated perithecium, and slender receptacle, the distal portion of which is relatively unusually reduced.

LABOULBENIA TERMINALIS, nov. sp.

Perithecium deeply suffused with smoky brown, slightly inflated, the inner margin evenly curved outwards, the outer more nearly straight, but bent abruptly outwards to the large prominent apex, the lips of which are well defined and outwardly oblique. Appendages arising from two basal cells, a very large outer and much smaller inner: the outer giving rise to two cells each of which bears terminally from two to three long slender tapering flexuous branches tinged, at least basally, with reddish brown: the inner bearing a single cell as a rule followed by two terminal cells which give rise to groups of two or three rather slender sessile antheridia: insertion cell placed just below the middle of the perithecium. Receptacle pointed below, broad above, nearly hyaline or evenly tinged with brownish, cell (7) slightly prominent below the perithecium. Spores $55 \times 5.5 \mu$. Perithecia $120-150 \times 45-50 \mu$. Receptacle $200-220 \mu$. Total length to tips of perithecium $275-340 \mu$.

On *Pterostichus luctuosus* Dej. Maine and Massachusetts.

This species occurs in tufts at the tips of the elytra or abdomen, apparently never elsewhere. It is allied to forms of *L. polyphaga* and *L. Pterostichi*, from which it is at once distinguished by its perithecium.

LABOULBENIA RIGIDA, nov. sp.

More or less deeply tinged with olive-brown. Perithecium becoming almost or quite opaque, somewhat inflated, a slight depression at its base above the more or less bulging terminal portion of the receptacle, its apex stout, snout-like, bent slightly inwards. Appendages arising from two basal cells, the outer of which gives rise to a single simple rigid branch, tapering slightly or not at all; the inner producing two similar somewhat shorter branches almost invariably simple and bearing near the base solitary sessile antheridia. Receptacle normal, sometimes rather elongate. Spores $75 \times 55 \mu$. Perithecia $125-150 \times 10 \mu$. Appendages (longest) 300μ . Receptacle $185-300 \mu$. Total length to tip of perithecium (largest) 300μ .

On *Pterostichus patruelis* Dej. Maine and Massachusetts.

This species may be distinguished by its rigid habit, straight single outer appendage and the blunt snout-like apex of its perithecium. It is one of the less well marked types of the genus, yet sufficient material from the two localities mentioned indicates that its characters are sufficiently well marked to warrant its specific separation from other species of the *flagellata* type.

LABOULBENIA CONFUSA, nov. sp.

Becoming deeply suffused with smoky brown. Perithecium rather small, inwardly inflated, the apex broad, slightly oblique outwards. Appendages arising primarily from an inner and outer cell: the outer bearing a second cell which bears terminally a dense tuft of hyaline flexuous tapering more or less divergent branches which are themselves more or less branched: the inner basal cell becoming several times divided and giving rise to numerous branches densely crowded and similar to the external ones. Receptacle consisting of a long sub-cylindrical basal cell, the sub-basal cell shorter and broader, cells (3-5) unusually large, causing this portion of the receptacle to bulge outwards in an evenly rounded and characteristic fashion. Perithecia $166 \times 55 \mu$. Appendages (longest) 150μ . Receptacle 215μ long, its basal cell $90-110 \times 25-40 \mu$. Total length to tip of perithecium, 315μ ; greatest width 75μ .

On *Bembidium* sp. Connecticut.

This species although based on scanty material seems quite distinct from its nearest allies, *L. luxurians* and *L. compacta*. Although the general arrangement of the appendages is similar in the present species, their flexuous divergent tapering habit is quite different from those of the two forms just mentioned, from which it is also distinguished by its larger size and peculiarly shaped receptacle. It occurs on the legs of a very small metallic-green *Bembidium*.

LABOULBENIA CORNUTA, nov. sp.

Dark blackish brown. Perithecium tapering to a broad blunt apex, from which projects a prominent straight dark brown appendage, unicellular, bent abruptly outwards from its base, tapering slightly to its nearly hyaline rounded tip. Appendages as in *L. luxurians*, the branches fewer and stouter. Receptacle short, expanding somewhat abruptly above the sub-basal cell, the basal cell becoming narrowed and nearly hyaline towards its base. Perithecium $85 \times 29 \mu$. Its appendage $26 \times 7 \mu$. Total length to tip of perithecial appendage 185μ , greatest width 52μ .

On *Bembidium complanulum* Mann. Washington (Miss Parker).

The five types of this singular species are all in poor condition, the appendages being, for the most part, broken; but it seems safe to describe it without regard to the termination of its appendages, since the terminal projection from the perithecium distinguishes it from all other known members of the genus, and finds a parallel only in *L. Gyridarum*, with which it can by no chance be confused. It was found on two specimens of the host, in each case growing in a definite position towards the base of the right elytron. The beetles were among material kindly collected for the writer by Miss A. M. Parker.

LABOULBENIA OBERTHURI Giard (in lit.).

Nearly hyaline except the brown or smoke-colored perithecium and sub-basal cell of the receptacle. Perithecium large, inflated towards the base, the narrower distal half abruptly rounded and contracted below a rather narrow apex with protruding lips bent outwards; general color dark brown, much deeper below the apex. Appendages numerous, crowded, slender, short, the lower segments inflated, arising as in *L. Guerinii*. Receptacle elongate, consisting of a short curved stout nearly hyaline basal cell, a very long sub-cylindrical sub-basal cell smoky brown in color with deeper brown wart-like or scale-like scattered prominences of varying size, the remaining cells normal except that the insertion cells of the appendages are irregularly divided. Perithecium $300-315 \times 120 \mu$. Receptacle 1 mm.-900 μ ; its sub-basal cell $370-425 \times 65-75 \mu$. Total length to tip of receptacle 1.225 mm.

On *Orectogyrus heros*, Reg. Madagascar.

This fine species has been kindly communicated to the writer by Professor Giard, who has dedicated it to M. René Oberthür, its discoverer. It is with the exception of the two species described above on *Mormolyce* by far the largest of the Laboulbeniae, and is closely allied to the form already known on Gyretes (*L. Guerinii* Rob.), from which, however, it is abundantly distinct.

HEIMATOMYCES DISTORTUS, nov. sp.

Pale yellowish, more or less clavate in general form. Perithecium inflated, its external margin strongly curved, becoming abruptly constricted below a long slender tubular terminal mouth, which is usually, but not always, bent abruptly outwards almost at right angles to the nearly straight inner margin of the perithecium. A short straight

bluntly pointed rather stout appendage arises on one side only of the perithecium, just below this tubular apex beyond which it projects. The basal and sub-basal cells of the receptacle about equal in length, the latter broader: distal portion of the receptacle composed of the usual four cells, the sub-terminal cell forming a distinct external prominence below the terminal cell which is bent towards and partly overlaps the perithecium. Perithecium (main body) $60 \times 18 \mu$, its tubular apex $18-25 \times 6 \mu$. Spores $20 \times 3 \mu$. Length of receptacle 110μ .

On *Laccophilus maculosus* Germ. Connecticut.

A singular species appearing at first sight malformed or abnormal. It occurs in company with *H. appendiculatus* on the anterior legs of its host.

HEIMATOMYCES UNCIGERUS, nov. sp.

Pale yellowish. Perithecium moderate, rather broad, its outer edge straight, its upper fourth free from the receptacle, its prominent bluntly tipped extremity bent abruptly outwards at right angles: a slender hooked appendage arises from a point close to the receptacle about two thirds of the distance from the base to the apex of the perithecium, projecting from it obliquely outwards. Basal cell of the receptacle large and long, the sub-basal cell small, sub-rectangular, flattened: the distal portion composed of the usual four cells, the terminal one not very prominent and bent strongly towards the perithecium. Perithecia $80 \times 22-25 \mu$. Spores $45 \times 4 \mu$. Perithecial appendage about 22μ long. Receptacle 132μ long. Total length to tip of perithecium 135μ .

On *Laccophilus maculosus* Germ. Connecticut.

The more or less wedge-shaped apex of the perithecium of this very distinct form projects outwards abruptly at right angles to the straight outer perithecial margin. The hook-like appendage is quite unlike that of any other species in form and position, and, occurring only on one side, is not seen unless the perithecium lies at the right. It occurs with *H. spinigerus*, *H. hyalinus*, and rarely *H. marginatus*, on the posterior legs of its host.

HEIMATOMYCES SPINIGERUS, nov. sp.

Brownish yellow. Perithecium small, its tip slightly exceeding that of the receptacle; its extremity blunt, lobed, curved outwards, and bearing two projections just below the tip, unequal in size, one of which extends outwards beyond the perithecial margin as a blunt

prominence. Basal cell of the receptacle often bent, expanding distally, much longer than the flattened sub-basal cell: the distal portion of the receptacle with greatly thickened external walls, and consisting of the usual four cells, the terminal one short, with a broad base and bent towards the apex of the perithecium. Three small cells are distinct below the perithecial cavity, from the outer of which is produced externally a prominent spur-like process. Perithecia $55 \times 15 \mu$. Total length to tip of perithecium $88-90 \mu$. Spur-like process $12-30 \mu$ long.

On *Laccophilus maculosus* Germ. Connecticut.

Distinguished from all other species by the spur-like process from the base of the perithecium. The septa are all defined with unusual clearness, the external walls being greatly thickened. Apparently among the rarest of the twelve species inhabiting this host.

DICHOMYCES PRINCEPS, nov. sp.

Nearly hyaline, becoming slightly and uniformly tinged with pale reddish brown, sometimes narrowly edged with blackish near the base. Receptacle large, consisting of a single small squarish basal cell, above which are three successive transverse rows of cells placed side by side, the upper margin of each series convex: the lower series consisting of a long narrow axial cell, with three or four more or less obliquely superposed cells on either side: the middle series consisting also of an axial cell, with five to eight cells on either side, which extend obliquely upwards and outwards to form a free rounded projection, each cell of which bears a short bladder-like appendage, the antheridia prominent at the base of each projection: the third or distal transverse series like the second, the cells often slightly more numerous, forming projections in a similar fashion on either side which bear the same bladder-like appendages. The axial cell of the terminal series is followed by two small cells, each bearing a short appendage, on either side of which a large somewhat flattened cell forms the base of the perithecium. Perithecia two, more or less divergent, elongate, slightly inflated and tapering gradually to the blunt apex. Perithecia $110-165 \times 22-30 \mu$. Spores $38 \times 4 \mu$. Receptacle $150-180 \times 70-75 \mu$.

On *Philonthus sordidus* Grav. Massachusetts.

A conspicuous species, occurring on all parts of the host, but especially on the inferior surface of the abdomen.

EUCANTHAROMYCES, nov. gen.

Receptacle consisting of two superposed cells, giving rise on one side to a free stalked perithecium, on the other to a free appendage. The appendage consisting of a basal and sub-basal cell terminated by a compound antheridium. The antheridium formed from numerous small cells, obliquely superposed in three rows, bordered externally by a sterile cell and terminated by a cavity from which the antherozoids are discharged through a short irregular finger-like projection.

EUCANTHAROMYCES ATRANI, nov. sp.

Pale straw-colored. Perithecium rather long, slightly inflated, tapering to a blunt apex with rounded lips, its stalk consisting of a single large free basal cell surmounted by three smaller cells. Basal and sub-basal cells of the receptacle long and very obliquely superposed, lying almost side by side. The appendage consisting of a basal cell not wholly free, but partially connected with the stalk cell of the perithecium at its base, followed by a second sub-triangular cell, the oblique upper walls of which separate it on the inside from the body of the antheridium proper, and on the outside from the long narrow cell which forms its sterile outer margin. Antheridium sub-cylindrical, with rounded apex consisting of three series of obliquely superposed cells decreasing in size from below upwards, and running obliquely upwards and outwards, the lower series of six cells, the middle of four, and the upper of two, the three series terminating in a common cavity filled with antherozoids, which are discharged through a terminal irregular finger-like projection which is bent strongly outwards. Perithecium $135 \times 35 \mu$. Length to tip of perithecium 260μ . To tip of antheridium 150μ .

On *Atranus pubescens* Dej. Virginia (T. Pergande).

Two specimens of this perplexing form were found in company with *Rhachomyces lusiophorus* on an example of *Atranus* kindly sent me by Mr. Pergande. The genus is based wholly upon the peculiar compound antheridium, which seems quite different in character from that of either *Cantharomyces* or *Camptomyces*, its nearest allies.

CERATOMYCES MIRABILIS Thaxter.

Abundant material of this species, collected in Maine and Massachusetts, indicates that the writer has confused two closely allied forms which were at first considered merely varieties of a single

species. The type of *C. mirabilis*, which is the most common species, is characterized by a stouter perithecium, the inner margin of which is strongly curved, the curve being broken by a rounded prominence on either side just below the apex, which is bent strongly to the base of the perithecial appendage. The perithecial appendage is evenly and distinctly inflated towards its base, and reaches a considerable length. The main axis of the antheridial appendage is short and stout, consisting of about a dozen superposed cells. From this type may be separated a second species, which may be designated as follows:—

CERATOMYCES CONFUSUS, nov. sp.

General habit and color as in *C. mirabilis*. Perithecium hardly inflated, its inner margin curving evenly to the prominent blunt apex which stands out free from the base of the perithecial appendage. The perithecial appendage shorter than in *C. mirabilis*, without the bulbous inflation at its base. Axis of antheridial appendage long and slender, distally attenuated, with comparatively few short branches. Receptacle as in *C. mirabilis*. Spores $75 \times 3.7 \mu$. Perithecia $235-335 \times 65 \mu$. Axis of antheridial appendage 235μ (longest). Receptacle $165 \times 75 \mu$.

On *Tropisternus glaber* Hb. and *T. nimbatus* Say. New England.

This species is much rarer than *C. mirabilis*, and is at once distinguished by the absence of any prominences below the apex of the perithecium, as well as by the differences presented by its perithecial and antheridial appendages. Otherwise the two species are easily confused.

